Non-CO_2 Greenhouse Gases: High-GWP Gases

Source/Sectors: Substitution of ODS/Motor Vehicle Air Conditioners

Technology: HFC-152a systems (C.1.1.3.3)

Description of the Technology:
HFC-152a has considerably lower GWP and therefore, is in use as a drop-in replacement for HFC-134a. This option can be used in both direct expansion and secondary loop MVAC systems (USEPA, 2006b). HFC-152a is also available for use in a "low-leak" system, which is expected to further reduce the emission. This option is expected to be in use beginning in 2012 (CEC, 2005).

Effectiveness: It can reduce total emissions by 89% as a result of its lower GWP (CEC, 2005).

Implementability: HFC-152a direct expansion systems in MVACs would not require any significant changes when being shifted from HFC-134a systems except for the safety enforcement such as refrigerant detector systems (USEPA, 2006b).

Reliability: Good

Maturity: The technology is still in the development phase (USEPA, 2006b).

Environmental Benefits: HFCs emission reduction

Cost Effectiveness:
This abatement option is estimated to have a capital cost of approximately $25/car; there is no available cost related data for the low-leak system (CARB, 2004). It has the lowest capital cost than any other MVAC options (USEPA, 2006b).

Technology	Lifetime (yrs)	MP (%)	RE (%)	TA (%)	Capital cost	Annual cost	Benefits
HFC-152a systems[1]	-	0	89	15	$192.33	$0.00	$54.15

Note: MP: market penetration; RE: reduction efficiency; TA: technical applicability; costs are in year 2000 US$/$MT_{CO2\text{-}Eq.}$
1: CEC (2005)

Industry Acceptance Level: HFC-152a will have a wide market share in Europe, Australia, and Japan; however, these countries might be shifting to CO_2 systems once it become commercially available. On the other hand, it will gain more and more share in North America, once it become available, because it is easy to shift from HFC-134a (USEPA, 2006b).

Limitations: Although the flammability of HFC-152a is less than hydrocarbons, safety systems would still be necessary; personnel training would also be needed (USEPA, 2006b).

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